

Features

- SiC MOSFET Technology
- High Blocking Voltage with Low On-resistance
- Low Capacitance
- Moisture Sensitivity Level 3
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant (Note 2)("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Typical Thermal Resistance: 1.29°C/W Junction to Case

Applications

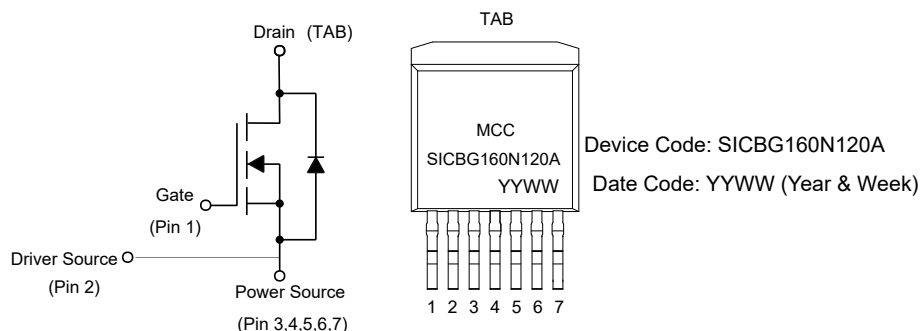
- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Power Factor Correction (PFC)
- Motor Drives

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage AC($f > 1\text{Hz}$)	V_{GSmax}	-5/+22	V
Gate-Source Voltage Static	V_{GSop}	-3/+18	V
Continuous Drain Current $V_{GS}=18\text{V}$	I_D	$T_c=25^\circ\text{C}$ 18	A
		$T_c=100^\circ\text{C}$ 12	
Pulsed Drain Current (Note 3)	I_{DM}	72	A
Single Pulse Avalanche Energy (Note 4)	E_{AS}	216	mJ
Total Power Dissipation	P_D	$T_c=25^\circ\text{C}$ 116	W
		$T_c=110^\circ\text{C}$ 50	

Note:

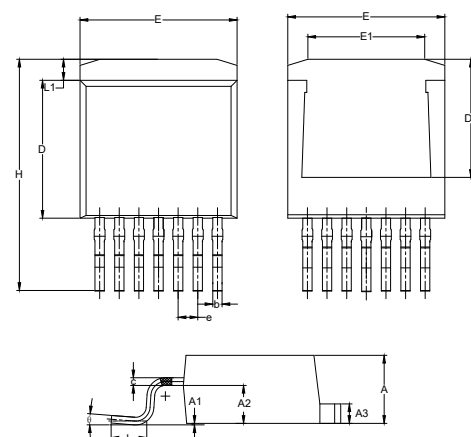
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemptions Applied, see EU Directive Annex 7a.
3. Pulse Test: Pulse Width Limited by T_{jmax} .
4. EAS Condition: $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $V_{GS}=20\text{V}$, $R_g=25\Omega$, $L=10\text{mH}$, $I_{AS}=6.6\text{A}$.

Internal Structure



N-CHANNEL MOSFET

TO-263-7L



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.167	0.183	4.24	4.64	
A1	0.000	0.010	0.00	0.25	
A2	0.096	0.108	2.45	2.75	
A3	0.045	0.055	1.15	1.40	
b	0.020	0.035	0.50	0.90	
c	0.017	0.024	0.45	0.60	
D	0.347	0.364	8.82	9.25	
D1	0.222		5.65		
E	0.392	0.408	9.96	10.36	
E1	0.256	0.310	6.50	7.89	
e	0.050		1.27		TYP.
H	0.575	0.625	14.61	15.88	
L	0.070	0.110	1.78	2.79	
L1	0.039	0.056	0.98	1.42	
θ	0°	8°	0°	8°	

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250uA	1200			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =-5/+22V			±250	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =1200V, V _{GS} =0V			10	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =2.5mA	1.5		3.0	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =20V, I _D =9A		118	140	mΩ
		V _{GS} =18V, I _D =9A		130	160	mΩ
		V _{GS} =16V, I _D =9A		150	180	mΩ
Internal Gate Resistance	R _g	f=1MHz		4.1		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S	V _{GS} =-3V		18		A
Diode Forward Voltage	V _{SD}	V _{GS} =-3V, I _{SD} =9A		4.3		V
Reverse Recovery Time	t _{rr}	V _{GS} =-3/+18V, I _{SD} =9A, V _R =800V, dI _F /dt=400A/μs		77.5		ns
Reverse Recovery Charge	Q _{rr}			205		nC
Peak Reverse Recovery Current	I _{rrm}			5.3		A
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =1000V,V _{GS} =0V,f=1MHz V _{AC} =25mV		780		pF
Output Capacitance	C _{oss}			42		
Reverse Transfer Capacitance	C _{rss}			6.2		
Coss Stored Energy	E _{oss}			23.6		μJ
Total Gate Charge	Q _g	V _{DS} =800V,V _{GS} =-3/+18V I _D =9A		47		nC
Gate-Source Charge	Q _{gs}			8.7		
Gate-Drain Charge	Q _{gd}			25		
Turn-On Delay Time	t _{d(on)}	V _{DD} =800V, V _{GS} =-3/+18V, R _{G(ext)} =2.5Ω, I _{DS} =9A, L=600μH		8		ns
Turn-On Rise Time	t _r			13		
Turn-Off Delay Time	t _{d(off)}			17		
Turn-Off Fall Time	t _f			16		
Turn-On switching energy	E _{on}			114		μJ
Turn-Off switching energy	E _{off}			7		

Curve Characteristics

Fig. 1 - Typical Output Characteristic($T_J=25^\circ\text{C}$)

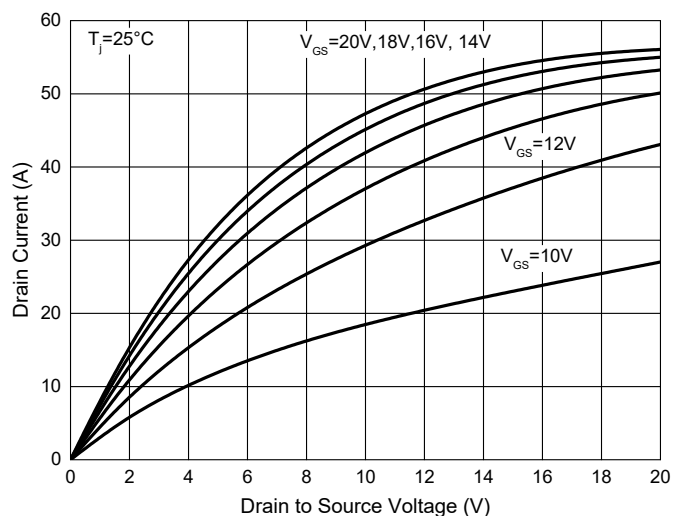


Fig. 2 - Typical Output Characteristic ($T_J=175^\circ\text{C}$)

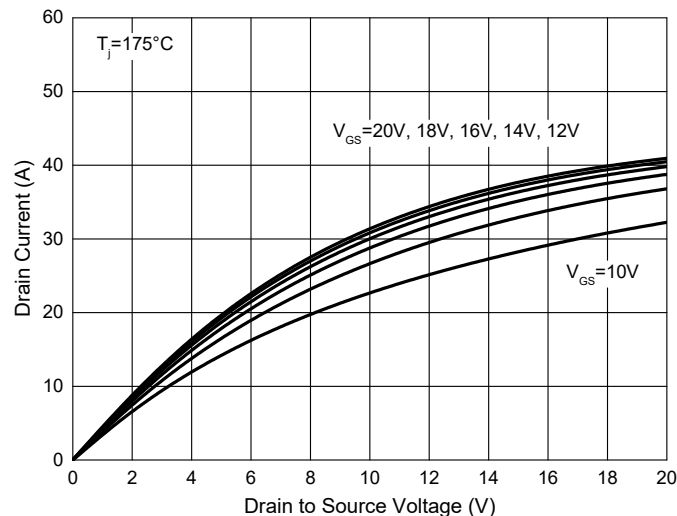


Fig. 3 - Typical Transfer Characteristic

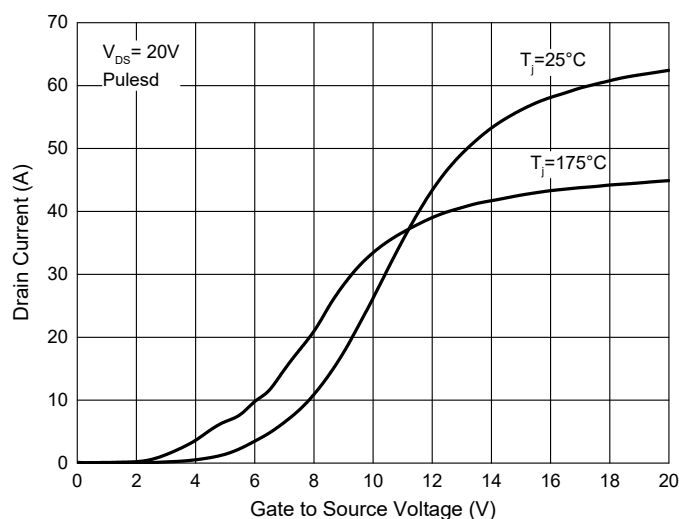


Fig. 4 - On-Resistance vs. Drain Current

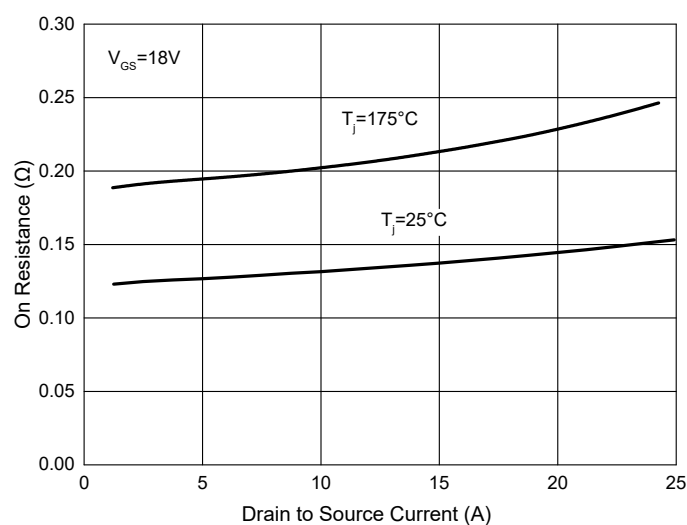


Fig. 5 On-Resistance vs Gate Voltage

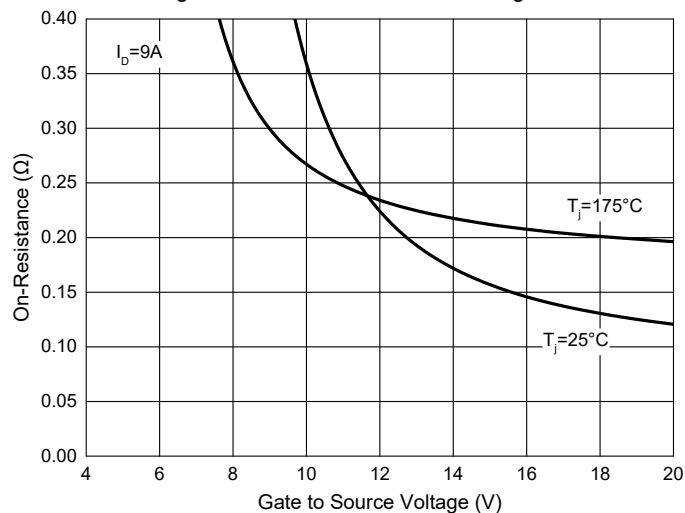
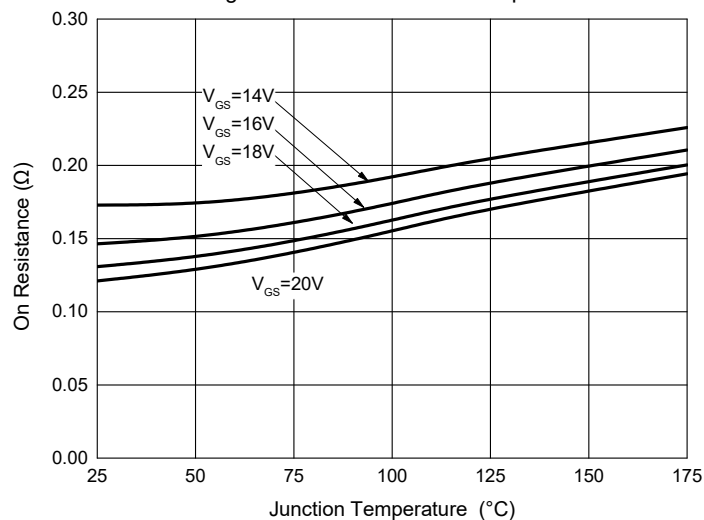


Fig. 6 - On-Resistance vs Temperature



Curve Characteristics

Fig. 7 - Normalized On-Resistance vs Temperature

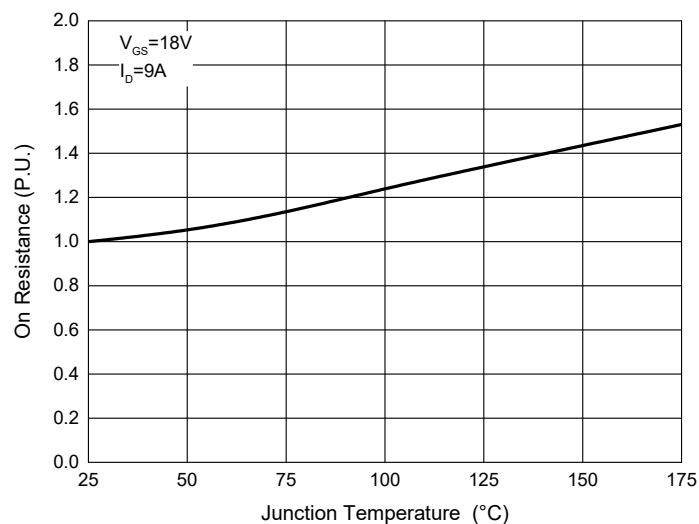


Fig. 8 - Body Diode Characteristic

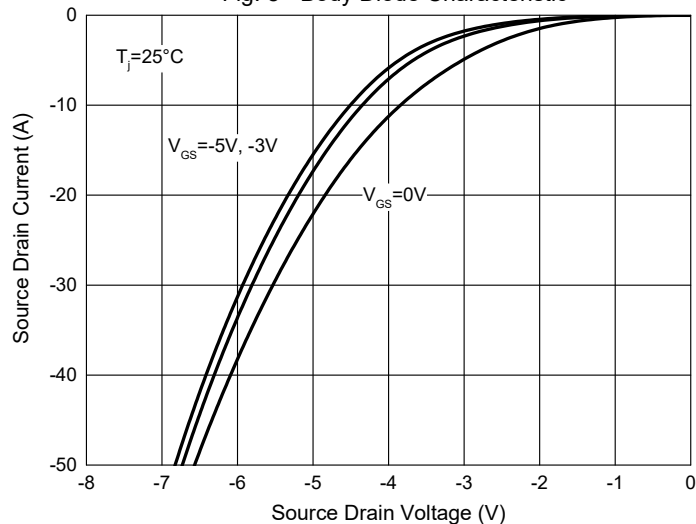


Fig. 9 - Body Diode Characteristic

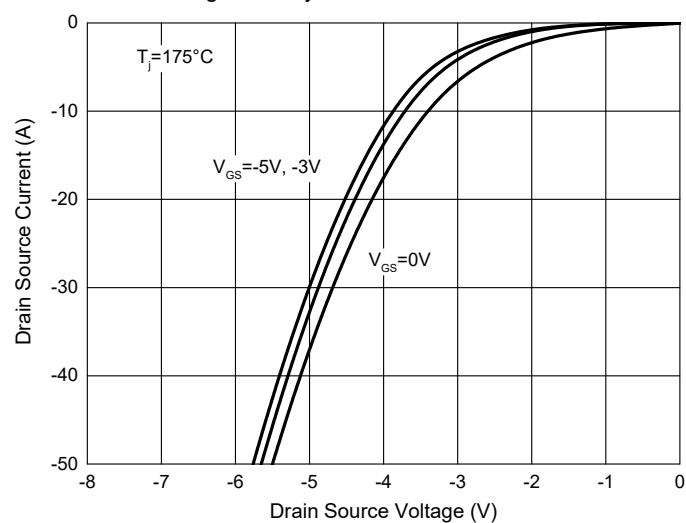


Fig. 10 - Output capacitor stored energy

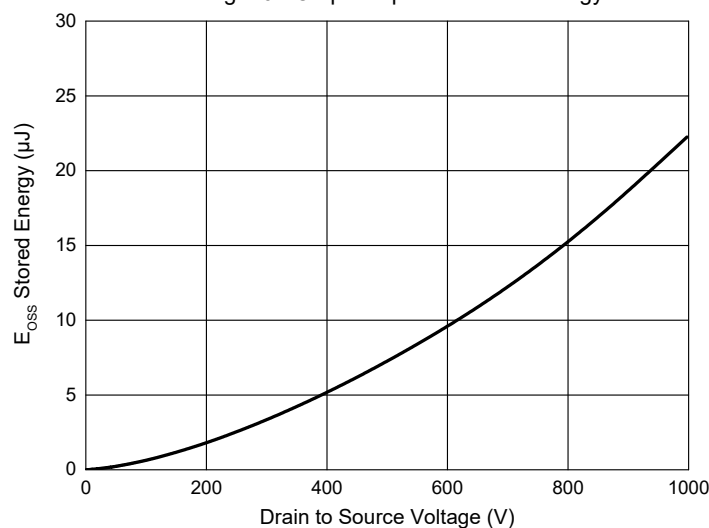


Fig. 11 - Threshold Voltage vs Temperature

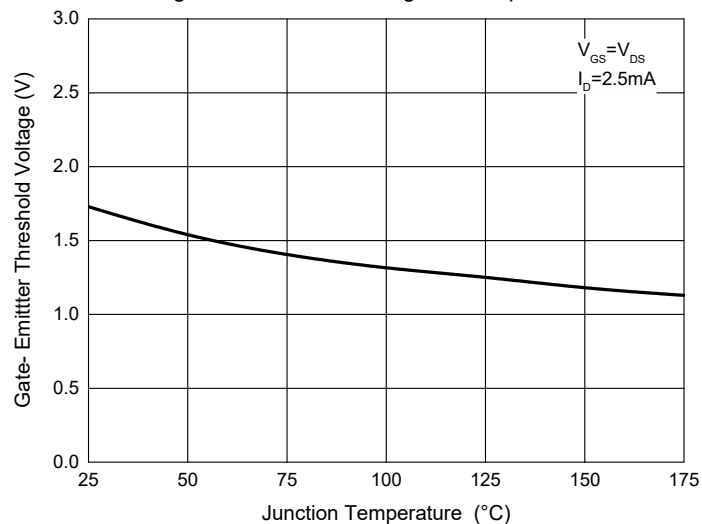
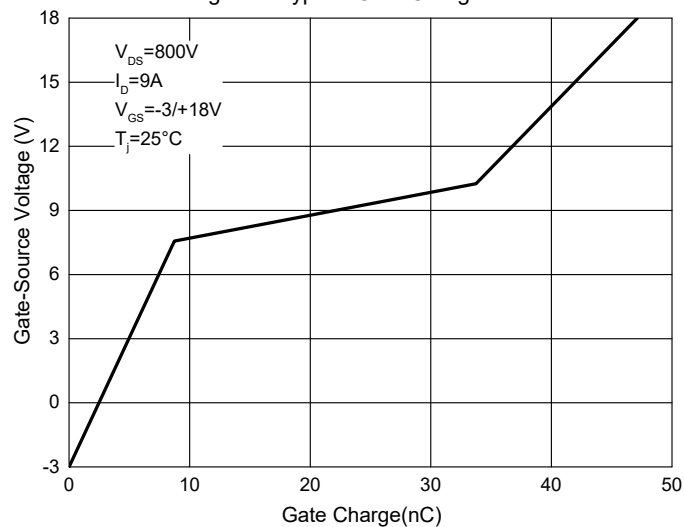


Fig. 12 - Typical Gate Charge



Curve Characteristics

Fig. 13 - Capacitance Characteristics

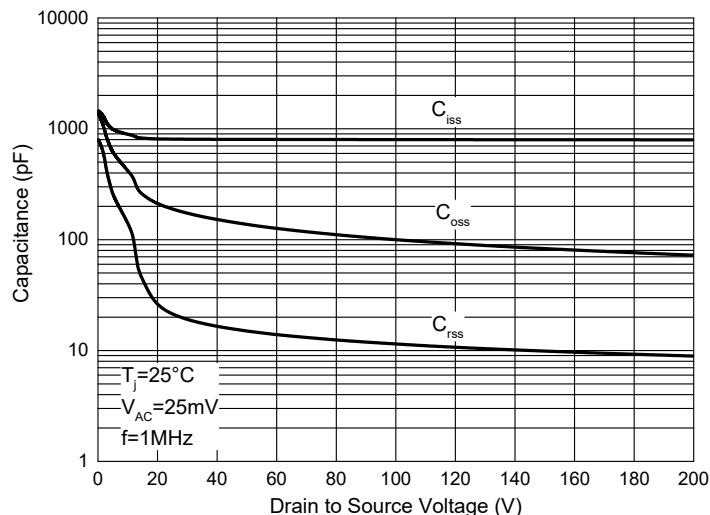


Fig. 14 - Capacitance Characteristics

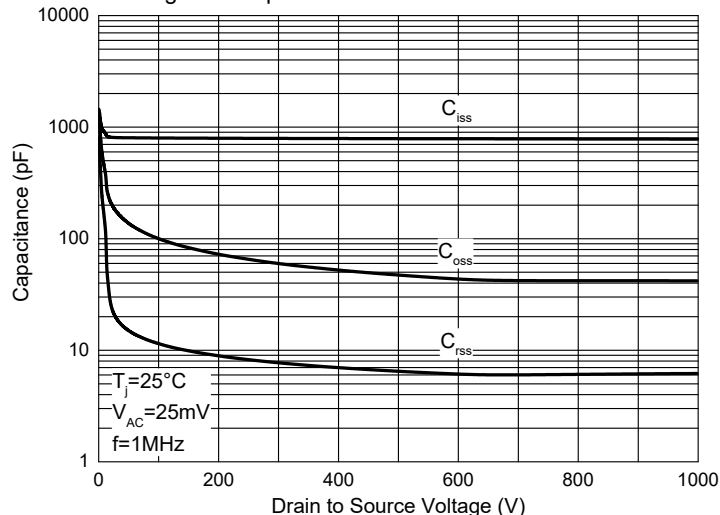


Fig. 15 - Drain Current Derating vs Case Temperature

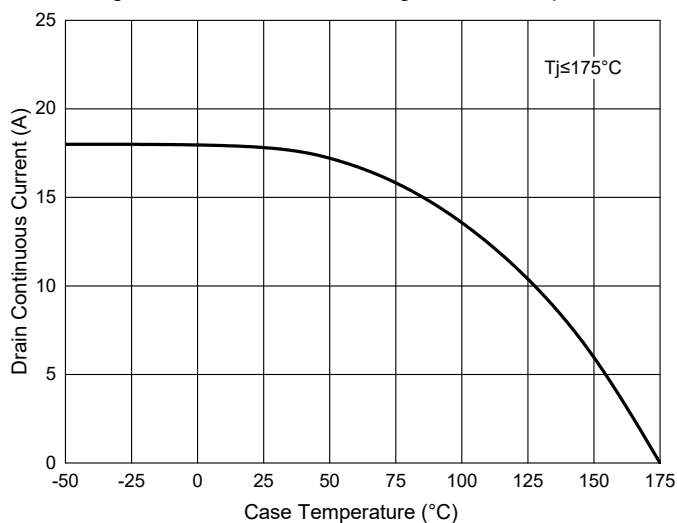


Fig. 16 - Junction to Case Transient Thermal Impedance

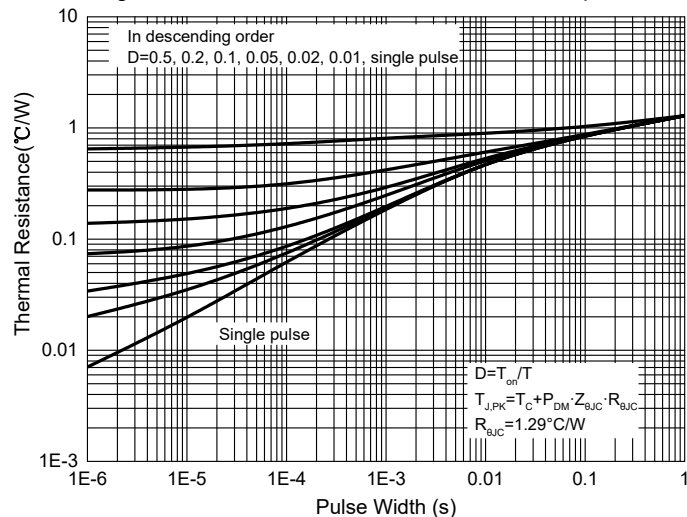


Fig. 17 - Safe Operation Area

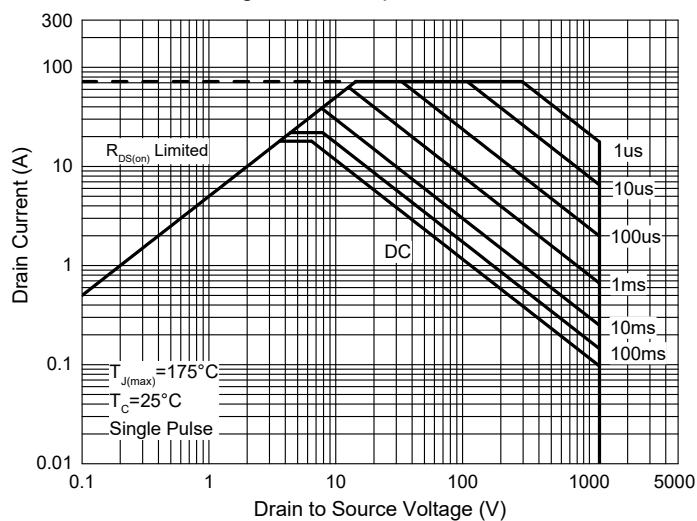
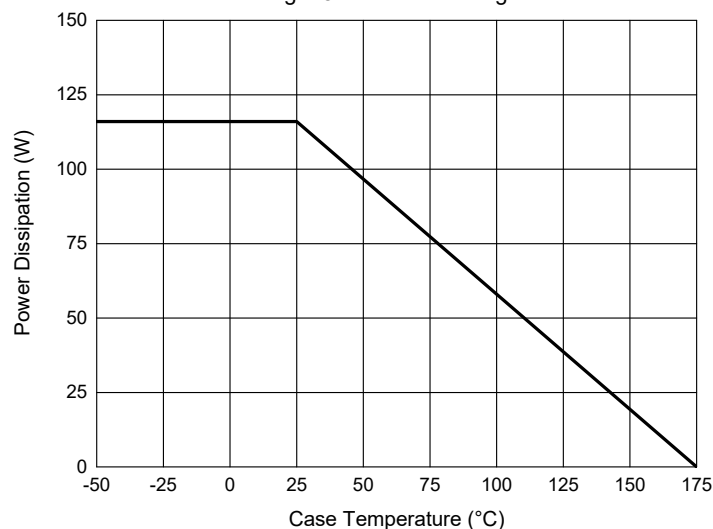


Fig. 18 - Power Derating



Ordering Information

Device	Packing
SICBG160N120A-TP	800pcs/Reel

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